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<110> Lei, Xingen
      Mullaney, Edward J
      Ullah, Abul H.J.
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<212> PRT

<213> Aspergillus niger

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Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp 35 40 45

Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys

105 110 100 Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 Thr Pro Phe Gly Glu Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 140 130 135 Gln Arg Tyr Glu Ser Leu Thr Arg Asn Ile Val Pro Phe Ile Arg Ser 150 155 Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly 165 170 175 Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser 180 185 Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn 200 205 Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala 210 215 220 Asp Thr Val Glu Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg 225 230 235

Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu 245 250 255

Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser 260 265 270

Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp 275 280 285

Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Glu Lys Tyr Tyr Gly
290 295 300

His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala 305 310 315 320

Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr 325 330 335

Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn 340 345 350

Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile

355 360 365

Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 375 380

Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

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<212> PRT

<213> Aspergillus fumigatus

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Val Asp Leu Gly Tyr Gln Cys Ser Pro Ala Thr Ser His Leu Trp Gly 35 40 45

Gln Tyr Ser Pro Phe Phe Ser Leu Glu Asp Glu Leu Ser Val Ser Ser
50 55 60

Lys Leu Pro Lys Asp Cys Arg Ile Thr Leu Val Gln Val Leu Ser Arg 65 70 75 80

His Gly Ala Arg Tyr Pro Thr Ser Ser Lys Ser Lys Lys Lys 85 90 95

Leu Val Thr Ala Ile Gln Ala Asn Ala Thr Asp Phe Lys Gly Lys Phe
100 105 110

Ala Phe Leu Lys Thr Tyr Asn Tyr Thr Leu Gly Ala Asp Asp Leu Thr
115 120 125

Pro Phe Gly Glu Gln Gln Leu Val Asn Ser Gly Ile Lys Phe Tyr Gln 130 135 140

Arg Tyr Lys Ala Leu Ala Arg Ser Val Val Pro Phe Ile Arg Ala Ser 145 150 155 160

Gly Ser Asp Arg Val Ile Ala Ser Gly Glu Lys Phe Ile Glu Gly Phe 165 170 175 Gln Gln Ala Lys Leu Ala Asp Pro Gly Ala Thr Asn Arg Ala Ala Pro Ala Ile Ser Val Ile Ile Pro Glu Ser Glu Thr Phe Asn Asn Thr Leu Asp His Gly Val Cys Thr Lys Phe Glu Ala Ser Gln Leu Gly Asp Glu Val Ala Ala Asn Phe Thr Ala Leu Phe Ala Pro Asp Ile Arg Ala Arg Ala Glu Lys His Leu Pro Gly Val Thr Leu Thr Asp Glu Asp Val Val Ser Leu Met Asp Met Cys Ser Phe Asp Thr Val Ala Arg Thr Ser Asp Ala Ser Gln Leu Ser Pro Phe Cys Gln Leu Phe Thr His Asn Glu Trp Lys Lys Tyr Asn Tyr Leu Gln Ser Leu Gly Lys Tyr Tyr Gly Tyr Gly Ala Gly Asn Pro Leu Gly Pro Ala Gln Gly Ile Gly Phe Thr Asn Glu Leu Ile Ala Arg Leu Thr Arg Ser Pro Val Gln Asp His Thr Ser Thr Asn Ser Thr Leu Val Ser Asn Pro Ala Thr Phe Pro Leu Asn Ala Thr Met Tyr Val Asp Phe Ser His Asp Asn Ser Leu Val Ser Ile Phe Phe Ala Leu Gly Leu Tyr Asn Gly Thr Glu Pro Leu Ser Arg Thr Ser Val Glu Ser Ala Lys Glu Leu Asp Gly Tyr Ser Ala Ser Trp Val Val Pro Phe Gly Ala Arg Ala Tyr Phe Glu Thr Met Gln Cys Lys Ser Glu Lys Glu Pro Leu Val Arg Ala Leu Ile Asn Asp Arg Val Val Pro Leu His

Gly Cys Asp Val Asp Lys Leu Gly Arg Cys Lys Leu Asn Asp Phe Val
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Lys Gly Leu Ser Trp Ala Arg Ser Gly Gly Asn Trp Gly Glu Cys Phe 450 455 460

Ser

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Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp 35 40 45

Gly Leu Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

Gln 145	Arg	Tyr	Glu	Ser	Leu 150	Thr	Arg	Asn	Ile	Val 155	Pro	Phe	Ile	Arg	Ser 160
Ser	Gly	Ser	Ser	Arg 165	Val	Ile	Ala	Ser	Gly 170	Lys	Lys	Phe	Ile	Glu 175	Gly
Phe	Gln	Ser	Thr 180	Lys	Leu	Lys	Asp	Pro 185	Arg	Ala	Gln	Pro	Gly 190	Gln	Ser
Ser	Pro	Lys 195	Ile	Asp	Val	Val	Ile 200	Ser	Glu	Ala	Ser	Ser 205	Ser	Asn	Asn
Thr	Leu 210	Asp	Pro	Gly	Thr	Cys 215	Thr	Val	Phe	Glu	Asp 220	Ser	Glu	Leu	Ala
Asp 225	Thr	Val	Glu	Ala	Asn 230	Phe	Thr	Ala	Thr	Phe 235	Val	Pro	Ser	Ile	Arg 240
Gln	Arg	Leu	Glu	Asn 245	Asp	Leu	Ser	Gly	Val 250	Thr	Leu	Thr	Asp	Thr 255	Glu
Val	Thr	Tyr	Leu 260	Met	Asp	Met	Cys	Ser 265	Phe	Asp	Thr	Ile	Ser 270	Thr	Ser
Thr	Val	Asp 275	Thr	Lys	Leu	Ser	Pro 280	Phe	Cys	Asp	Leu	Phe 285	Thr	His	Asp
Glu	Trp 290	Ile	Asn	Tyr	Asp	Tyr 295	Leu	Gln	Ser	Leu	Lys 300	Lys	Tyr	Tyr	Gly
His 305	Gly	Ala	Gly	Asn	Pro 310	Leu	Gly	Pro	Thr	Gln 315	Gly	Val	Gly	Tyr	Ala 320
Asn	Glu	Leu	Ile	Ala 325	Arg	Leu	Thr	His	Ser 330	Pro	Val	His	Asp	Asp 335	Thr
Ser	Ser	Asn	His 340	Thr	Leu	Asp	Ser	Ser 345	Pro	Ala	Thr	Phe	Pro 350	Leu	Asn
Ser	Thr	Leu 355	Tyr	Ala	Asp	Phe	Ser 360	His	Asp	Asn	Gly	Ile 365	Ile	Ser	Ile
Leu	Phe 370	Ala	Leu	Gly	Leu	Tyr 375	Asn	Gly	Thr	Lys	Pro 380	Leu	Ser	Thr	Thr
Thr 385	Val	Glu	Asn	Ile	Thr 390	Gln	Thr	Asp	Gly	Phe	Ser	Ser	Ala	Trp	Thr 400

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Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala
405 410 415
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Glu Gln Glu Pro Leu Val Arg Val Leu Val As
n Asp Arg Val Val Pro 420 425 430

Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser 435 440 445

Phe Val Arg Gly Leu Ser Phe Ala Arg Ser Gly Gly Asp Trp Ala Glu 450 455 460

Cys Phe Ala 465

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Ser Val Asp Arg Gly Tyr Gln Cys Phe Pro Glu Leu Ser His Lys Trp
                             40
Gly Leu Tyr Ala Pro Tyr Phe Ser Leu Gln Asp Glu Ser Pro Phe Pro
                         55
                                             60
Leu Asp Val Pro Asp Asp Cys His Ile Thr Phe Val Gln Val Leu Ala
                     70
                                         75
Arg His Gly Ala Arg Ser Pro Thr Asp Ser Lys Thr Lys Ala Tyr Ala
                                     90
                 85
Ala Thr Ile Ala Ala Ile Gln Lys Asn Ala Thr Ala Leu Pro Gly Lys
                                105
Tyr Ala Phe Leu Lys Ser Tyr Asn Tyr Ser Met Gly Ser Glu Asn Leu
        115
                          120
                                                125
Asn Pro Phe Gly Arg Asn Gln Leu Gln Asp Leu Gly Ala Gln Phe Tyr
    130
                        135
                                            140
Arg Arg Tyr Asp Thr Leu Thr Arg His Ile Asn Pro Phe Val Arg Ala
145
                  150
                                       155
                                                            160
Ala Asp Ser Ser Arg Val His Glu Ser Ala Glu Lys Phe Val Glu Gly
                165
                                    170
                                                        175
Phe Gln Asn Ala Arg Gln Gly Asp Pro His Ala Asn Pro His Gln Pro
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Ser Pro Arg Val Asp Val Val Ile Pro Glu Gly Thr Ala Tyr Asn Asn

Thr Leu Glu His Ser Ile Cys Thr Ala Phe Glu Ala Ser Thr Val Gly

Asp 225	Ala	Ala	Ala	Asp	Asn 230	Phe	Thr	Ala	Val	Phe 235	Ala	Pro	Ala	Ile	Ala 240
Lys	Arg	Leu	Glu	Ala 245	Asp	Leu	Pro	Gly	Val 250	Gln	Leu	Ser	Ala	Asp 255	Asp
Val	Val	Asn	Leu 260	Met	Ala	Met	Cys	Pro 265	Phe	Glu	Thr	Val	Ser 270	Leu	Thr
Asp	Asp	Ala 275	His	Thr	Leu	Ser	Pro 280	Phe	Cys	Asp	Leu	Phe 285	Thr	Ala	Ala
Glu	Trp 290	Thr	Gln	Tyr	Asn	Tyr 295	Leu	Leu	Ser	Leu	Asp 300	Lys	Tyr	Tyr	Gly
Tyr 305	Gly	Gly	Gly	Asn	Pro 310	Leu	Gly	Pro	Val	Gln 315	Gly	Val	Gly	Trp	Ala 320
Asn	Glu	Leu	Ile	Ala 325	Arg	Leu	Thr	Arg	Ser 330	Pro	Val	His	Asp	His 335	Thr
Cys	Val	Asn	Asn 340		Leu	Asp	Ala	Asn 345		Ala	Thr	Phe	Pro 350	Leu	Asn
Ala	Thr	Leu 355		Ala	Asp	Phe	Ser 360		Asp	Ser	Asn	Leu 365		Ser	Ile
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Thr 385		. Glu	ı Asp) Ile	Thr 390		, Thr	Asp	Gly	7 Tyr 395		Ala	Ala	Trp	Thr 400
Val	Pro	⊳ Ph∈	e Ala	a Ala 405		Ala	а Туг	: Ile	410		. Met	Gln	ı Cys	Arg 415	Ala
Glı	ı Lys	s Glı	n Pro 420		ı Val	. Arç	g Val	L Leu 425		_ Asr	n Asp	Arg	y Val 430		Pro
Let	ı His	43		s Ala	a Val	. Asp	Ası 440		ı Gly	y Arg	g Cys	445		y Asp	Asp
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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Ala Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys 100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly 165 170 175

Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser 180 185 190 Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala Asp Thr Val Glu Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Lys Lys Tyr Tyr Gly His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser

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Cys Phe Ala

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Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp
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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Glu Gly Lys Lys Tyr Ser

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Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
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Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

Gln Arg Tyr Glu Ser Leu Thr Arg Asn Ile Val Pro Phe Ile Arg Ser 145 150 155 160 Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala Asp Thr Val Glu Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Lys Lys Tyr Tyr Gly His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser 435 440 445

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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Glu Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125 Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr Gln Arg Tyr Glu Ser Leu Thr Arg Asn Ile Val Pro Phe Ile Arg Ser Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala Asp Thr Val Glu Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Lys Lys Tyr Tyr Gly His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr

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Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

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<213> Aspergillus niger

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Gln	Arg	Leu	Glu	Asn 245	Asp	Leu	Ser	Gly	Val 250	Thr	Leu	Thr	Asp	Thr 255	Glu

Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser 260 265 270

Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp 275 280 285

Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Arg Lys Tyr Tyr Gly
290 295 300

His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala 305 310 315 320

Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr 325 330 335

Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn 340 345 350

Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile 355 360 365

Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 380

Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro
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Cys Phe Ala 465

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<213> Aspergillus niger

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \begin{array}{c} c_{aacggggaa} \\ atgctggatc \\ gcctttctct \\ c_{gagaaa} \\ c_{ctccacttc} \\ c_{gagaaa} \\ c_{ctccacttc} \\ c_{ctccacttc} \\ c_{ctccactaga} \\ c_{ctccactagact} \\ c_{ctccactagact} \\ c_{ctc} \\ c_{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \begin{array}{c} g_{\text{cct}t_{\text{tctc}}} \\ f_{\text{ccgt}} \\ f_{\text{cta}} \\
                                                                                                                                                                                                                                                                                                                                                                                                                                                            \begin{array}{c} t_{cc} \\ t_{tg} \\ t_{ga} \\ g_{ct} \\ t_{ct} \\ f_{tg} \\ f_{ga} \\ g_{ct} \\ f_{ct} \\ g_{ct} \\ g_{ac} \\ g_{ct} \\ g_{ac} \\ g_{ct} \\ g_{ct} \\ g_{ac} \\ g_{ac} \\ g_{ct} \\ g_{c
                                                                                                                                                                                                                                                                                                                                                                                                                                             \begin{array}{c} t_{tgt} \\ gat_{tat} \\ gaa_{gt} \\ t_{tat} \\ t_{ag} \\ gac_{ct} \\ t_{ct} \\ cat_{ag} \\ gac_{ct} \\ t_{ct} \\ cat_{ag} \\ gac_{ct} \\ t_{ct} \\ cat_{ag} \\ gac_{gt} \\ t_{ct} \\ cat_{ag} \\ gac_{gt} \\ t_{ct} \\ cat_{ag} \\ gac_{gt} \\ t_{ct} \\ cat_{ag} \\ cat_{ct} \\ cat_{gt} \\ gaa_{gg} \\ gat_{aa} \\ fac_{gt} \\ gaa_{gg} \\ gat_{gaa} \\ gaa_{gg} \\ gat_{aa} \\ fac_{gt} \\ fac_{gt} \\ fac_{ga} \\ fac_{g
                                                                                                                                                                                                                                                                                                                                                                                                                               \begin{array}{c} ggt_{tatatag} \\ gaaat_{tactt} \\ gct_{tatag} \\ gct_{tatatag} \\ gct_{ta
                                                                                                                                                                                                                                                                                                                                                                                                                   \begin{array}{c} c_{gaatcggtc} \\ c_{tcccgtcat} \\ f_{gaggagatc} \\ c_{tgaggagatc} \\ c_{tgaggagatc} \\ c_{tgaggagatc} \\ c_{tgacggatcat} \\ c_{tgacggatcat} \\ c_{tgacggaaaa} \\ c_{tccaaggacctt} \\ c_{tgacggaaaa} \\ c_{tccaaggacctt} \\ c_{tgacggaaaa} \\ c_{tccaaggacctt} \\ c_{tgacggaaaa} \\ c_{tccaaggacctt} \\ c_{tgacggaaaa} \\ c_{tccaaggacct} \\ c_{tgaagacata} \\ c_{tgacgaaaaa} \\ c_{tccaaggacct} \\ c_{tgaagacata} \\ c_{tgaa
                                                                                                                                                                                                                                                                                                                                         \begin{array}{c} c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{aa}c_{a
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                                                                                                                                                                                                                    \begin{array}{c} cct_{cat}gg_{ac} \\ ccc_{ct}t_{ct}gg_{ac} \\ atg_{gc}c_{ct}t_{ct}t \\ gac_{aa}g_{tat} \\ fac_{gg}c_{cat}g \\ gt_{gca}gg_{ta} \\ gt_{gca}gg_{ta} \\ ccc_{gc}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c_{ca}c
                                                                                                                                                                                                      \begin{array}{c} c_{ccctt} \\ g_{acaaa} \\ g_{tat} \\ g_{accaaa} \\ g_{tat} \\ g_{ccat} \\ g
                                                                                                                                                                                           \begin{array}{c} g_{aca_{aa}gt_{at}} \\ c_{gct_{aa}cg_{ag}} \\ c_{acactttg} \\ g_{actc_{ga}gc_{cc}} \\ g_{actc_{ga}gc_{cc}} \\ g_{gct_{ga}gc_{cc}} 
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Catgc accactatccc atacgctaca 2640

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Met Gly Val Ser Ala Val Leu Leu Pro Leu Tyr Leu Leu Ser Gly Val 1 5 10 15

Thr Ser Gly Leu Ala Val Pro Ala Ser Arg Asn Gln Ser Ser Cys Asp 20 25 30

Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp 35 40 45

Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

Gln Arg Tyr Glu Ser Leu Thr Arg Asn Ile Val Pro Phe Ile Arg Ser 145 150 155 160

Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly 165 170 175

Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser 180 185 190

Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn 195 200 205

Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala 210 215 220 Asp Thr Val Glu Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Thr Lys Tyr Tyr Gly His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser Phe Val Arg Gly Leu Ser Phe Ala Arg Ser Gly Gly Asp Trp Ala Glu Cys Phe Ala

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<213> Aspergillus niger

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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys 100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly 165 170 175

Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser 180 185 190

Ser	Pro	Lys 195	ITe	Asp	Val	Val	11e 200	Ser	Glu	Ala	Ser	Ser 205	Ser	Asn	Asn
Thr	Leu 210	Asp	Pro	Gly	Thr	Cys 215	Thr	Val	Phe	Glu	Asp 220	Ser	Glu	Leu	Ala
Asp 225	Thr	Val	Glu	Ala	Asn 230	Phe	Thr	Ala	Thr	Phe 235	Val	Pro	Ser	Ile	Arg 240
Gln	Arg	Leu	Glu	Asn 245	Asp	Leu	Ser	Gly	Val 250	Thr	Leu	Thr	Asp	Thr 255	Glu
Val	Thr	Tyr	Leu 260	Met	Asp	Met	Cys	Ser 265	Phe	Asp	Thr	Ile	Ser 270	Thr	Ser
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Cys Phe Ala

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Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp
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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
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Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
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Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

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Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

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Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
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90

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Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

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Glu Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

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Cys Phe Ala 465

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<212> DNA

<213> Aspergillus niger

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Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Lys Lys Tyr Tyr Gly 290 295 300

His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala 305 310 315 320

Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr 325 330 335

Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn 340 345 350

Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile 355 360 365

Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 380

Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro
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Cys Phe Ala

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<211> 2665

<212> DNA

<213> Aspergillus niger

<400> 43

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<210> 44
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<211> 467

<212> PRT

<213> Aspergillus niger

<400> 44

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Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser 260 265 270

Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp 275 280 285

Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Arg Glu Tyr Tyr Gly 290 295 300

His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala 305 310 315 320

Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr 325 330 335

Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn 340 345 350

Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile 355 360 365

Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 380

Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

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Phe Val Arg Gly Leu Ser Phe Ala Arg Ser Gly Gly Asp Trp Ala Glu 450 455 460

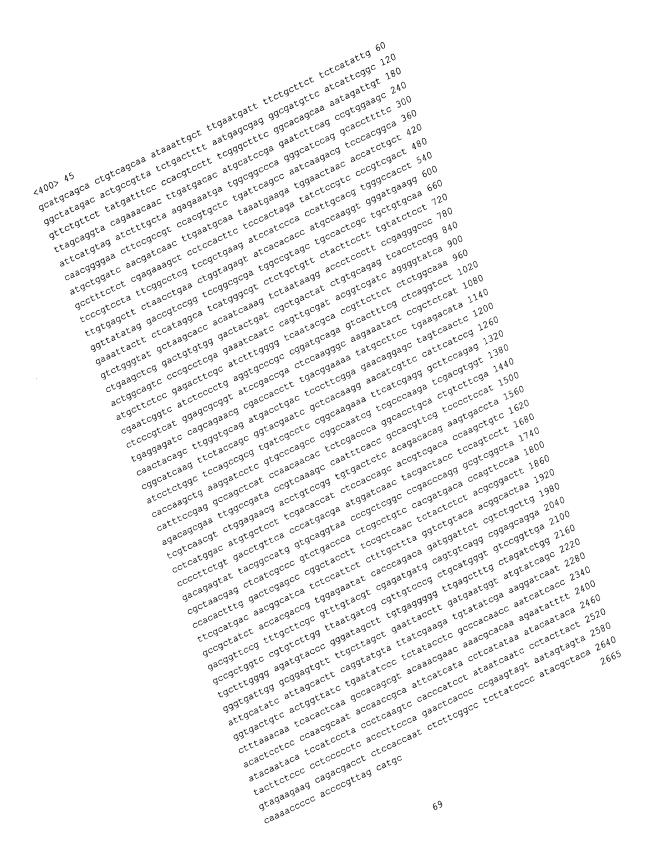
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<210> 45

<211> 2665

<212> DNA

<213> Aspergillus niger



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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser
                         55
Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
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Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu

Thr Pro Phe Gly Glu Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr

Gln Arg Tyr Glu Ser Leu Thr Arg Asn Ile Val Pro Phe Ile Arg Ser

Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly

Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser

Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn

Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala

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<211> 467

<212> PRT

<213> Aspergillus niger

<400> 48

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35 40 45

Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly 165 170 175

Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser 180 185 190

Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala Asp Thr Val Lys Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Asp Glu Tyr Tyr Gly His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala Glu Glu Gro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser

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Cys Phe Ala 465

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<213> Aspergillus niger

<400> 49

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<212> PRT

<213> Aspergillus niger

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Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp

35 40 45

Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
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Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Glu Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
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Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140

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Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro
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Cys Phe Ala 465

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Thr Val Asp Gln Gly Tyr Gln Cys Phe Ser Glu Thr Ser His Leu Trp 35 40 45

Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser 65 70 75 80

Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Glu Tyr Ser 85 90 95

Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
100 105 110

Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125

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Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

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<400> 53

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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
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Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Ala Gly Lys Lys Tyr Ser 85 90 95 Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr Gln Arg Tyr Glu Ser Leu Thr Arg Asn Ile Val Pro Phe Ile Arg Ser Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala Asp Thr Val Gln Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Glu Lys Tyr Tyr Gly His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn

Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile 355 360 365

Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 380

Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

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n Asp Arg Val Val Pro 420 425 430

Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser 435 440 445

Phe Val Arg Gly Leu Ser Phe Ala Arg Ser Gly Gly Asp Trp Ala Glu 450 455 460

Cys Phe Ala

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<212> DNA

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<210> 56
<211> 467
<212> PRT
<213> Aspergillus niger
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<400> 56

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Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60

Pro 65	Glu	Val	Pro	Ala	Gly 70	Cys	Arg	Val	Thr	Phe 75	Ala	Gln	Val	Leu	Ser 80
Arg	His	Gly	Ala	Arg 85	Tyr	Pro	Thr	Asp	Ser 90	Lys	Gly	Lys	Ala	Tyr 95	Ser
Ala	Leu	Ile	Glu 100	Glu	Ile	Gln	Gln	Asn 105	Ala	Thr	Thr	Phe	Asp 110	Gly	Lys
Tyr	Ala	Phe 115	Leu	Lys	Thr	Tyr	Asn 120	Tyr	Ser	Leu	Gly	Ala 125	Asp	Asp	Leu
Thr	Pro 130	Phe	Gly	Glu	Gln	Glu 135	Leu	Val	Asn	Ser	Gly 140	Ile	Lys	Phe	Tyr
Gln 145	Arg	Tyr	Glu	Ser	Leu 150	Thr	Arg	Asn	Ile	Val 155	Pro	Phe	Ile	Arg	Ser 160
Ser	Gly	Ser	Ser	Arg 165	Val	Ile	Ala	Ser	Gly 170	Lys	Lys	Phe	Ile	Glu 175	Gly
Phe	Gln	Ser	Thr 180	Lys	Leu	Lys	Asp	Pro 185	Arg	Ala	Gln	Pro	Gly 190	Gln	Ser
Ser	Pro	Lys 195	Ile	Asp	Val	Val	Ile 200	Ser	Glu	Ala	Ser	Ser 205	Ser	Asn	Asn
Thr	Leu 210	Asp	Pro	Gly	Thr	Cys 215	Thr	Val	Phe	Glu	Asp 220	Ser	Glu	Leu	Ala
Asp 225	Thr	Val	Ala	Ala	Asn 230	Phe	Thr	Ala	Thr	Phe 235	Val	Pro	Ser	Ile	Arg 240
Gln	Arg	Leu	Glu	Asn 245	Asp	Leu	Ser	Gly	Val 250	Thr	Leu	Thr	Asp	Thr 255	Glu
Val	Thr	Tyr	Leu 260	Met	Ala	Met	Cys	Ser 265	Phe	Asp	Thr	Ile	Ser 270	Thr	Ser
Thr	Val	Asp 275	Thr	Lys	Leu	Ser	Pro 280	Phe	Cys	Asp	Leu	Phe 285	Thr	His	Asp
Glu	Trp 290	Ile	Asn	Tyr	Asp	Tyr 295	Leu	Gln	Ser	Leu	Asp 300	Lys	Tyr	Tyr	Gly
His 305	Gly	Ala	Gly	Asn	Pro 310	Leu	Gly	Pro	Thr	Gln 315	Gly	Val	Gly	Tyr	Ala 320

Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr 325 330 335

Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn 340 345 350

Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile 355 360 365

Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 380

Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400

Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415

Glu Glu Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430

Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser 435 440 445

Phe Val Arg Gly Leu Ser Phe Ala Arg Ser Gly Gly Asp Trp Ala Glu 450 455 460

Cys Phe Ala

<210> 57

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide for generating site-specific insertions

<400> 57

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21

<210> 58

<211> 21

<212> DNA

<213>	Artificial Sequence	
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<210> 64
<211> 27
<212> DNA
<213> Artificial Sequence
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<223> Description of Artificial Sequence:
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<210> 65
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<210> 66
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<223> Description of Artificial Sequence: Primer
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<210> 67
<211> 24
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<213> Artificial Sequence
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<211> 2665
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<213> Aspergillus niger
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gttctgttct tatgatttcc ccacgtcctt tcgggctttc ggcacagcaa aatagattgt 180
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<212> PRT
<213> Aspergillus niger

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1 5 10 15
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<210> 69

Thr Ser Gly Leu Ala Val Pro Ala Ser Arg Asn Gln Ser Ser Cys Asp

20 25 30

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		35					40					45			

- Gly Gln Tyr Ala Pro Phe Phe Ser Leu Ala Asn Glu Ser Val Ile Ser 50 55 60
- Pro Glu Val Pro Ala Gly Cys Arg Val Thr Phe Ala Gln Val Leu Ser
 65 70 75 80
- Arg His Gly Ala Arg Tyr Pro Thr Asp Ser Lys Gly Lys Lys Tyr Ser 85 90 95
- Ala Leu Ile Glu Glu Ile Gln Gln Asn Ala Thr Thr Phe Asp Gly Lys
 100 105 110
- Tyr Ala Phe Leu Lys Thr Tyr Asn Tyr Ser Leu Gly Ala Asp Asp Leu 115 120 125
- Thr Pro Phe Gly Glu Gln Glu Leu Val Asn Ser Gly Ile Lys Phe Tyr 130 135 140
- Ser Gly Ser Ser Arg Val Ile Ala Ser Gly Lys Lys Phe Ile Glu Gly 165 170 175
- Phe Gln Ser Thr Lys Leu Lys Asp Pro Arg Ala Gln Pro Gly Gln Ser 180 185 190
- Ser Pro Lys Ile Asp Val Val Ile Ser Glu Ala Ser Ser Ser Asn Asn · 195 200 205
- Thr Leu Asp Pro Gly Thr Cys Thr Val Phe Glu Asp Ser Glu Leu Ala 210 215 220
- Asp Thr Val Lys Ala Asn Phe Thr Ala Thr Phe Val Pro Ser Ile Arg 225 230 235 240
- Gln Arg Leu Glu Asn Asp Leu Ser Gly Val Thr Leu Thr Asp Thr Glu 245 250 255
- Val Thr Tyr Leu Met Asp Met Cys Ser Phe Asp Thr Ile Ser Thr Ser 260 265 270
- Thr Val Asp Thr Lys Leu Ser Pro Phe Cys Asp Leu Phe Thr His Asp

275 280 285

Glu Trp Ile Asn Tyr Asp Tyr Leu Gln Ser Leu Thr Lys Tyr Tyr Gly
290 295 300

- His Gly Ala Gly Asn Pro Leu Gly Pro Thr Gln Gly Val Gly Tyr Ala 305 310 315 320
- Asn Glu Leu Ile Ala Arg Leu Thr His Ser Pro Val His Asp Asp Thr 325 330 335
- Ser Ser Asn His Thr Leu Asp Ser Ser Pro Ala Thr Phe Pro Leu Asn 340 345 350
- Ser Thr Leu Tyr Ala Asp Phe Ser His Asp Asn Gly Ile Ile Ser Ile 355 360 365
- Leu Phe Ala Leu Gly Leu Tyr Asn Gly Thr Lys Pro Leu Ser Thr Thr 370 375 380
- Thr Val Glu Asn Ile Thr Gln Thr Asp Gly Phe Ser Ser Ala Trp Thr 385 390 395 400
- Val Pro Phe Ala Ser Arg Leu Tyr Val Glu Met Met Gln Cys Gln Ala 405 410 415
- Glu Gln Glu Pro Leu Val Arg Val Leu Val Asn Asp Arg Val Val Pro 420 425 430
- Leu His Gly Cys Pro Val Asp Ala Leu Gly Arg Cys Thr Arg Asp Ser 435 440 445
- Phe Val Arg Gly Leu Ser Phe Ala Arg Ser Gly Gly Asp Trp Ala Glu 450 455 460

Cys Phe Ala

465